

PLANETARY ENGINEERING

To Save The EARTH



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*And indeed there will be time to wonder, "Do I dare?" and, "Do I dare?"
Time to turn back and descend the stair, with a bald spot in the
middle of my hair....Do I dare disturb the universe?*

T.S. Eliot

Introduction

The answer to T. S. Elliot's plea is a resounding **Yes!** Earth is going into a period of heightened danger to its physical integrity. More severe superwaves are forecasted by the work of Paul LaViolette.¹ Standard science is not in position to offer solutions to the wholesale challenge represented by a galactic superwave of catastrophic proportions. In this essay, we are going to explore solutions to the challenge offered standard model, classical physics and by what has come to be known *as idiomaterial life physics.*

TOWARD DEVELOPING A GNOSIVE TECHNOLOGY OF ACTIONABLE SOLUTIONS

This introduction is a rough estimate of where human science and technology currently is in identifying and pinpointing possible locations of Dyson-type structures as detectors of advanced extraterrestrial civilizations. Meanwhile, back in 2005, when probabilities began to be gnosively studied about the effects of superwaves and their effects on the Sun, several of us at LPGC saw Dyson's proposal as a conceptual framework with applications other than the detection of extraterrestrial civilizations in the Milky Way.

Thus, I invented the idea of a framework of actionable solutions as methods of gnosive engineering at the star system level, and went on to examine and study Lyran gnosive technologies as possible means of energetic propulsion for each proposed solution. J. N. Traveler, J. A. Sanchez and I then also began a serious look and study of Ša.A.Mi (also known as home-planet Nibiruan) timeline gnosive technologies. In 2007, the third piece of the puzzle became available to us: macroquantum tunneling by using micro-ERB (Einstein-Rosen Bridge) as a naturally-occurring wormhole.

I

Toward a Dyson Solution concept

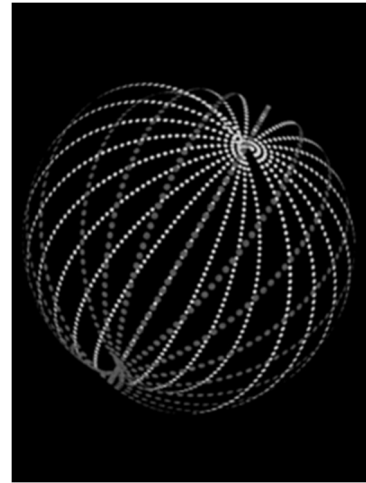


The concept of the Dyson sphere was the result of a thought experiment by physicist and mathematician Freeman Dyson, when he theorized that all technological civilizations constantly increased their demand for energy. He reasoned that if our civilization expanded energy demands long enough, there would come a time when it demanded the *total* energy output of the Sun. He proposed a system of orbiting structures (which he referred to initially as a *shell*) designed to intercept and collect all energy produced by the Sun. Dyson's proposal did not detail how such a system would be constructed, but focused only on issues of energy collection. His original thought experiment about the system for energy collection was about a spherical structure. Such a "sphere" would be a system of orbiting solar power satellites meant to completely encompass a star and capture most or all of its energy output.

Dyson speculated that such structures would be the logical consequence of the long-term survival and escalating energy needs of a

technological civilization, and proposed that searching for evidence of the existence of such structures might lead to the detection of advanced intelligent extraterrestrial life. Since then, other variant designs involving building an artificial structure or series of structures to encompass a star have been proposed in exploratory engineering or described in science fiction under the name "Dyson sphere."

These later proposals have not been limited to solar-power stations. Many involve habitation or industrial elements. Most fictional depictions describe a solid shell of matter enclosing a star, which is considered the least plausible variant of the idea. The variant closest to Dyson's original conception is the "Dyson swarm". It consists of a large number of independent constructs (usually solar power satellites and space habitats) orbiting in a dense formation around the star. This construction approach has advantages: components could be sized appropriately, and it can be constructed incrementally. Various forms of wireless energy transfer could be used to transfer energy between components and earth. The key disadvantage is that the nature of orbital mechanics would make the arrangement of the orbits of the swarm extremely complex. Another potential problem is the increasing loss of orbital stability when adding more elements increases the probability of orbital perturbations.



Is all of this science fiction seeking a place in current science?

Not quite. In 1960 Dyson [1] suggested that an advanced civilization inhabiting a solar system might break up the planets into very small planetoids or pebbles to form a loose shell that would collect all the light coming from the star. The shell of planetoids would vastly increase the available "habitable" area and absorb all of the visible light. The stellar energy would be reradiated at a much lower temperature. If the visible light was totally absorbed by the planetoids a pure Dyson Sphere signature would be an infrared object with luminosity equivalent to the hidden star and a blackbody distribution with a temperature

corresponding to the radius of the planetoid swarm. For the case of the Sun with the planetoids at the radius of the Earth the temperature would be approximately 300 °K. Many of the earlier searches for Dyson Spheres have looked for so-called partial Dyson Spheres where the loose shell only partially obscures the star. The Dyson Sphere investigation at Fermilab looks for so-called pure Dyson Spheres as well as partial Dyson Spheres. The Fermilab Dyson sphere search was covered in a June, 2008 Fermilab astrophysics seminar. The article was published as *Astrophysical Journal* **698** 2075-2086 (2009). Let's take a closer look at these searches.

A. The Fermilab Dyson sphere searches

The Fermilab Phase I IRAS filter-based search for Dyson spheres was reported at the International Astronautical Congress in Vancouver in 2004. Phase II, a more sophisticated search using the IRAS Low Resolution Spectrometer (LRS), has now been published. An ideal instrument for a Dyson sphere study is an all sky survey covering a wide wavelength band centered in the 10 micron regime equivalent to 300 degrees Kelvin. These two requirements were satisfied by the mid-eighties IRA SIMBAD Astronomical Database satellite. A central mission for IRAS was to study cosmic dust. Since there was no premium on resolution and the mirror had a 0.6 m diameter. Still, the performance was great for a Dyson Sphere survey. The sensitivity was 1 Jansky while the angular resolution was 1 minute. Starting from a 250,000 source sample sources were discarded if the IRAS flux quality for the 12 and 25 μm filters only corresponded to an upper limit. This left 10982 sources. The search focused on a temperature range of 100 to 600 °K leaving about 6521 sources. No cut was made on proximity to other sources. By doing this partial Dyson spheres were not ruled out.

A bit of history. After Dyson's proposal in 1960, twenty years went by before a spacecraft carrying a liquid-helium-cooled detector of

long-wave infra-red radiation was launched. In 1983 the Infra-red Astronomy Satellite (IRAS), an international mission funded jointly by the United States, the United Kingdom and the Netherlands, did the first sky-survey in the long-wave infra-red band, discovering 245389 sources [2] (Beichman, 1987). The mission was spectacularly successful. It discovered that the sky is infested with infra-red sources. The vast majority of the sources are identifiable natural objects. Many are new-born stars which are still embedded in the dense dust-clouds out of which they recently condensed. The dust-clouds are heated by the new-born stars inside them, and radiate away the energy of the stars in the form of infra-red radiation. As seen by our infra-red detectors, these natural "cocoon stars" look just like alien civilizations. Old stars such as *carbon stars* going off the *Asymptotic Giant Branch* also blow off large dust clouds. If any alien civilizations exist in our neighborhood, they are hidden among the huge population of natural infra-red sources.

Since most of the infra-red sources have reasonable astrophysical explanations Ockham's famous razor plays an important role – we should use the simplest explanation. Still, in spite of the challenge of natural Dyson sphere look-alikes scientists such as *Carl Sagan* and *Jill Tarter*, Director of the Center for SETI Research at the SETI Institute, tried to find the Dyson sphere needles in the infra-red haystack. Recently *Dick Carrigan* (Carrigan, 2009) has used information from the IRAS low resolution spectrometer (**LRS**) to build on earlier IRAS filter-based searches by several Russian astronomers including Kardashev and Viacheslav Slysh. Carrigan has found that only a handful of the IRAS sources come close to passing muster as a Dyson sphere. *Many sources have clear spectrographic lines that identify them as mimics*. Part of Carrigan's toolkit is fitting to a *Planck blackbody distribution*. That is a step beyond but also a step down from Dyson's original and more general perspective. In practice, most of the LRS spectra don't look much like a Dyson sphere and have higher temperatures. The search suggests that there are few if any even mildly interesting candidates within several hundred light years of earth.

Several other astronomers including Dan Werthimer, famous as the originator of the SETI@home program and Jun Jugaku have looked for

so-called “partial” Dyson spheres where the star is only partly obscured. They have carried out the searches by looking for infra-red excesses around visible stars. No likely candidates were reported in searches of several thousand stars.

After IRAS, other spacecraft have been launched, carrying more sensitive detectors and discovering an even larger number of sources. The Spitzer Space Telescope is the best of the breed with much better resolution and sensitivity than IRAS. In most cases the mission has focused hard on investigating natural sources in more detail. One part of the mission, GLIMPSE (*Galactic Legacy Infrared Mid-Plane Survey Extraordinaire*), has used filters to investigate infra-red sources in the galactic plane. Ed Churchwell from the University of Wisconsin reports that GLIMPSE has identified on the order of 100 million sources, 90% of which are cool red giants. Unfortunately all of the Spitzer filters are at shorter wavelengths so the sample population is biased toward temperatures above the natural range for life. In order to continue the search for Dyson spheres the problem of discriminating artificial from natural sources must continue to be faced. Until there is excellent discrimination with few false alarms, increasing the sensitivity of detectors will not help.

B. The Dyson Concept as a framework for actionable solutions

While Freeman Dyson and Dick Carrigan were concerned with finding extraterrestrial civilizations in consortium with the Seti project, here we are concerned with finding a solution to the problems of direct exposure to superwaves and to the probability of using naturally-occurring wormholes for tunneling planet-size macroquantum objects. But first things first: actionable Einstein-Rosen bridges. Everything hinges on a micro-EBR being possible on demand (much as how K'ai tunneled us from northern Michigan to the Pacific Coast Highway north

of the metropolitan Los Angeles area in 2007 and then again in 2009). We must then find a viable geometry for consonant gnosive harmonic resonance between two points in space by two COBE (complex oscillating biological entity) groups located on two different locations in the solar system. And finally cap everything is access to a source of energy sufficient to create a *Casimir* capacitor capable of sustaining effects at both ends of the tunnel, and keep the spacetime fuzzy such that constraints due to conditions of matter described by the equations of the state of matter do not apply to the exotization of the matter at the mouths of the wormholes. One of the statements made by K'ai to us drives us in this regard; he told us that it is by far much easier to induce matter to become something else than to force matter into behaving in ways that these constraints do not allow it to do so.

1. On standard wormholes and quantum wormholes

At the 1994 Advanced Quantum/Relativity Theory Propulsion Workshop we discussed two types of wormholes, the "standard" Morris-Thorne (MT) spherical wormhole [3] [4] and the somewhat more housebroken Visser wormhole [4]. Both wormhole types are shortcuts through space-time, completely consistent with standard gravity theory, that appear to offer the possibility of faster-than-light travel and even time travel. Michael Morris from Butler University in Indianapolis gave the first AQ RTP (*Advanced Quantum/Relativity Theory Propulsion*) Workshop presentation. Mike did his Caltech PhD thesis with Kip Thorne on the original formulation of spherical wormholes. Morris-Thorne wormholes, first described in a 1988 paper in the American Journal of Physics, are spatial shortcuts that an advanced civilization, one capable of manipulating planet-masses of energy, might be able to snatch from the quantum foam, inflate to a useful size, and stabilize by placing a Casimir-effect spherical capacitor in the wormhole mouth. These could, in principle, be used for faster-than-light travel and even time travel.

There are some problems, however, with the MT spherical wormhole scenario [6]: (1) the Casimir capacitor needs to provide a very large quantity of negative energy, perhaps a Jupiter-mass in size, and this must be in delicate balance with the equivalent positive energy of the wormhole's spatial curvature, (2) large radial tension (stretching force) and tangential pressure (squeezing force) develop in the wormhole mouth, which would probably destroy an observer attempting to traverse the wormhole, and (3) recent work by Steven Hawking and others indicates that if a wormhole becomes a time machine, it will probably destroy itself. Morris discussed these problems.

Visser's wormholes provide the FTL space traveler with a more benign environment. Visser conceives the creation of his wormhole geometry as "cutting similar holes in two regions of space-time and then sewing the edges together". Instead of distributing the curvature of space at the wormhole mouth over a broad region, including the space through which the traveler must pass, Visser would frame a flat-space wormhole connection with "struts" that contain a region of very sharp curvature. The material needed to make the struts is not ordinary matter, but in a sense it is perhaps available. Over the past decade, cosmologists have speculated about cosmic strings, linear fractures in the fabric of space that are solutions of Einstein's equations. The usual cosmic strings are very massive, perhaps an Earth-mass per meter. To frame his flat wormholes, Visser needs a slightly different string solution that has the property of negative mass. The negative mass of the strut edges (as in the MT wormhole) is balanced by the positive mass of the mouths themselves, leaving the wormhole structure with a relatively small (perhaps zero) mass. Visser suggests making a wormhole mouth in the form of a cube, with flat-space wormhole connections on the square sides and strings as the edges. Each cube-face may connect to the face of another wormhole-mouth cube, or the 6 cube faces may connect to 6 different cube faces in 6 separated locations. The Visser Cube of wormhole mouths is reminiscent of the familiar SciFi notion of a star gate.

Natural Wormholes: Our technical capabilities at present are not up to the task of creating either of MT or Visser wormholes. Therefore, the

question arises of whether they might occur naturally. In this context it is very interesting that cosmic strings are a component of Visser wormholes. Cosmologists have speculated that loops of cosmic string might be produced in the early phases of the Big Bang, particularly the so-called inflationary phase when the emerging universe undergoes very rapid expansion. The usual scenario is that if such string-loops were created in the early universe they would probably oscillate, disperse their large mass-energy as gravity waves, and disappear. However, if a cosmic string had negative mass this decay process would not be possible because negative energy gravity waves presumably cannot be generated.

The formation of such negative-energy string loops framing a wormhole during the Big Bang could result in a stable object that had a net positive mass. This, then, is a plausible scenario for the formation of stable natural wormholes that might still exist in our universe. As this scenario emerged from the 1994 discussion, the focus of the gathering turned to the question of how, if such natural wormholes exist, we might search for and find them. And they invented a way.

If a positive electric charge Q passes through a wormhole mouth, the electric lines of force radiating away from the charge must thread through the aperture of the wormhole. The net result is that the entrance wormhole mouth has lines of force radiating away from it, and the exit wormhole mouth has lines of force radiating toward it. In effect, the entrance mouth has now been given a positive electric charge Q , and the exit mouth acquires a corresponding negative charge $-Q$. Similarly, if a mass M passes through a wormhole mouth, the entrance mouth has its mass increased by M , and the exit mouth has its mass reduced by an amount M . In the early universe these mass changes might create a dynamically unstable situation. If one natural wormhole mouth begins to increase in mass, its twin will correspondingly be reduced in mass until it acquires a net negative mass. The mouth with positive mass will attract more mass to it, while its negative-mass twin will gravitationally repel any nearby mass. Thus, this mass imbalance should grow until it eventually it is damped by the growing distance scales from the expansion of the universe.

The net conclusion of this line of reasoning is that there might be natural wormhole mouths of planet-size or starsize negative mass within our galaxy. These would repel nearby masses but, like normal stars or planets, would be attracted to the mass of our galaxy and orbit around it. The large negative mass of such objects might be exploited in searching for them. We realized that a negative mass object would also produce a gravitational lensing effect, but in the form of a diverging rather than converging lens. Thus, the background star should be briefly dimmed or extinguished if a negative mass object passed through the line of sight. During the week-long workshop at JPL, one of the attendees did quick calculation of the shape of this profile. The star intensity first increases, then vanishes, then returns, producing a time profile that is quite distinctive and, if it exists, should be discernible in the MACHO search data.

Time Holes and Catastrophe: The original paper describing MT wormholes also described a way in which they could be made into time machines by using relativistic time dilation to create a time difference between one mouth and the other. Hawking has suggested that while Nature does not abhor a vacuum She may very well abhor a time machine. His calculations indicate that vacuum fluctuations of drastically increasing energy, rather like the audio feedback we experience with a PA system when we bring a microphone too close to the speaker, will arise just as the wormhole connection becomes "timelike". This arises because the magnitude of quantum vacuum fluctuation depends on the space-time interval (square root of distance squared minus $c \cdot \text{time squared}$) around a circuit threading through the wormhole and then back in normal space. As a wormhole becomes a time machine this interval first becomes very small, then becomes zero, and then becomes negative. During this transition in the region near zero interval it crosses what is called "the Cauchy Horizon". There the quantum fluctuations should, according to Hawking's calculations, grow without limit and destroy the wormhole.

It is interesting to note that it is the transition through the Cauchy Horizon that produces this catastrophe, not the existence of a time-spanning wormhole. If somehow the time-spanning wormhole (negative

interval) could be established, it would perhaps be as stable as a space-spanning wormhole (positive interval). An interesting corollary of this is that even when two wormholes each span a positive interval, a path threading both of them can have a zero interval leading to the Cauchy instability. Visser in a recent paper showed that under certain circumstances the instability might be evaded, but only for very small aperture wormholes separated by a distance approaching the diameter of the universe. If there are naturally occurring wormholes, it was suggested that because of back-reaction they might arrange themselves to fill all of the available wormhole "space" and to vigorously resist, though quantum fluctuations and back reaction, any attempt to create new wormholes or to significantly alter the space-time connections of existing ones.

Even if stable wormholes are possible, these problems may be insoluble. But there is a plausible scenario for solving them. To provide the needed acceleration, consider a conventional particle accelerator like the then proposed Superconducting Supercollider (SSC) to be constructed in Waxahachie, Texas in the 1990s. The SSC is designed to accelerate protons to near-light velocities that give a time-dilation factor of $\gamma = 20,000$. This is to be done with "conventional" technology, accelerating the particles repeatedly through a series of superconducting magnets and accelerating cavities.

Now consider a wormhole which is deliberately arranged to have a very small mass, a few micrograms or less, by giving it a relatively small amount of energy. Such a wormhole, according to MTY, is stabilized by placing large electric charges in both of its portal openings. If, once the charges are in place, they remain there without the assistance of external machinery, then the wormhole portal is in effect a stable massive particle with a large mass and a large electric charge. A properly designed SSC-like structure could accelerate this wormhole portal, just as the SSC accelerates protons. In fact, if the wormhole portal has approximately the same charge-to-mass ratio as a proton, the same accelerating structure will serve for accelerating both. In that case the SSC could also accelerate wormhole portals to a time-dilation factor of

20,000, a nice value, as we shall see, for exploring the nearest hundred thousand light years of our galaxy.

2. How to create a stable wormhole

There is presently no well-established theory that can accommodate both quantum mechanics and the physics of strong gravitational fields within the same mathematical framework. The paper of Morris, Thorne, and Yurtsever [5] is a vehicle for guessing, in a rather unorthodox way, what restrictions a proper theory of quantum gravity might place on the physics of wormholes; general relativity contains within its framework mechanisms that appear to permit both faster-than-light travel and time travel. If these physical calamities are to be averted, the authors argue, it can only be done through a proper theory of quantum gravity.

Empty space, when examined with quantum theory on a sufficiently small distance scale, is not empty at all. Even at nuclear dimensions (i.e., 10^{-13} cm) empty space is filled with particle-antiparticle pairs that are continually flashing into a brief existence, bankrolled on the credit of borrowed mass-energy, only to wink out of existence again as the law of conservation of energy reasserts itself. If the length-scale is contracted to a size appropriate to quantum gravity (10^{-33} cm) this quantum fireworks intensifies to a *quantum foam* of violent fluctuations in the topology and geometry of space itself.

Quantum black holes form and vanish in a span of time of 10^{-23} seconds; highly curved and convoluted regions of space in a physically allowed configuration have a similarly brief existence. In this environment Morris, Thorne, and Yurtsever speculate, it may be possible for a civilization considerably more advanced than ours, by "pulling a wormhole out of the quantum foam and enlarging it to classical size" to create a connection between two nearby points in space. This would use the well-known quantum mechanical process called "tunneling", a jump from one allowed energy state to another across a barrier of intermediate states that are forbidden by energy conservation.

To stabilize the wormhole pulled from the quantum foam, preventing its immediate recollapse, Morris, Thorne, and Yurtsever propose to use an electric field of such enormous strength that it creates enough energy in the mouth of the wormhole to force it to remain open. They suggest that this might be accomplished by placing a pair of spheres with equal electric charges at the two spatial entrances of the wormhole. The spheres would be held in place by a delicate balance, the force of their gravitational attraction just offsetting the force of their electrical repulsion. Such a system might be very small, an atom-scale opening permitting the passage of only a few photons at a time, or it might be large enough to pass a large vehicle.

Once stabilized, the size of the connection can be enlarged or contracted depending on energy considerations. The two portal ends of the wormhole connection can be separated from each other.

This brings us to the last point of the Morris, Thorne, and Yurtsever paper, the construction of a time machine. Suppose that initially a wormhole establishes a connection between two spatial points **A** and **B** that have no motion with respect to each other and are simultaneous in time. By "simultaneous", a slippery concept in relativity, we mean that an observer at **A** who determines a clock reading at **B** would get the same reading via normal space (by light beam signals corrected for transit time, for example) as he would through the wormhole.

Now suppose, in the spirit of the Twin Paradox of special relativity, that portal **B** is placed aboard a space ship while portal **A** remains on Earth. The ship carrying **B**, say, accelerates rapidly to 86.6% of light speed and travels a distance of one light-year, then reverses its course and returns to Earth at the same speed. On its arrival portals **A** and **B** are placed near one another. At 86.6% of the velocity of light any clock aboard the ship will run at just half the speed of a similar clock on Earth due to relativistic time dilation. Therefore at the end of the trip the ship's clock will be one year slow, as compared to an identical clock that remained on Earth. And, as Morris, Thorne, and Yurtsever point out, portal **B** will also be one year slow as compared with portal **A**. Now a message sent through **B** to **A** will emerge one year in the future of **B**, and a message sent through **A** to **B** will emerge one year in the past of

A! Similarly a traveler making the same trips through the wormhole will travel one year into the future or the past. The wormhole connection through space has been transformed to a connection through time, a wormhole time machine.

Does this device, embodying faster-than-light space travel as well as time travel, demonstrate that special relativity is wrong? Does it show that Einstein's speed limit had been defeated? Not at all. The restrictions usually associated with special relativity implicitly assume that no time travel is possible. Clearly one could travel, in effect, at an infinite velocity by traveling from one place to another at some sub-light velocity and then on arrival traveling backwards in time to the instant of departure. To put it another way, the simultaneity measurements prohibited by special relativity must lead to a definite and unambiguous determination of the simultaneous readings of two clocks separated in space. The clock-comparisons made possible by wormholes are not definite, because one clock could be in the future of the other, displaced by any time interval produced by the travel histories of the portals. Special relativity, which after all is embedded in the theory of general relativity that produced these revelations about wormhole physics, is preserved.

The law of physics that would be destroyed by the construction of a wormhole space-time connection is *causality*, the mysterious principle that forbids communication backwards in time, requires a cause to precede its effects in time sequence in all space-time reference frames. Causality as a law of the universe would not survive even a two-way communications link across time, let alone a portal permitting trans-time matter transmission. So if causality is to be preserved as a law of physics, it has to be so at the quantum level.

A view of wormholes through Special Relativity. Einstein's special theory of relativity treats space-time in a very even-handed and symmetric way. It requires a complete equivalence of "inertial reference frames", space-time coordinate systems moving through space with any constant speed (including zero). These must be equivalent by any internal measurement that would single out one such frame as special. Thus, a semi-permanent wormhole would present a problem for special

relativity not only because it would breach the light-speed barrier but also because the reference-frame symmetry would be broken. If a wormhole connection between separated regions of space existed only long enough to permit a message to be sent, it would seem that a reference-frame test could be made that would single out one reference frame as "preferred". Absolute space would be detected and defined. I and the two others who were on the RV when K'ai made the vehicle disappear from one spacetime frame to another believe this is precisely what he did.

Sergei V. Krasnikov of the Central Astronomical Observatory in Pulkovo, Russia, using Einstein's general theory of relativity, may have found a way around the negative energy problem. He has shown that for these wormholes, the negative mass-energy needed for stabilization is supplied solely by quantum fluctuations of fields in the vacuum. Thus, these wormholes need no "exotic matter" for their construction. His calculations indicate that it may be possible to construct a large transversable wormhole using only normal positive-mass matter and fields. For more than 80 years, Einstein's general theory of relativity has remained physics' "standard model" for gravity. In 1935 Einstein and his colleague Nathan Rosen discovered that implicit in general relativity is a tunnel-like structure in the topology of space-time, which we now call a wormhole. The mathematical equation (or "metric") of a wormhole describes a curved-space object that is a shortcut through space-time itself. A wormhole may connect two regions of space-time in the same universe (or can even connect two separate universes).

In principle, a wormhole can also make a "timelike" connection between one time and another in the same region of space, so that it becomes in effect a time machine, allowing communication and travel between the past and the future. However, some wormhole theorists, including Steven Hawking, have suggested that our universe may enforce a "chronology protection", with increasing vacuum fluctuations destroying any wormhole that is on the verge of become a time machine.

In 1988 Michael Morris and Kip Thorne of Cal Tech showed that stable wormholes are possible after all. They found that to stabilize a

wormhole, a region of negative mass-energy was needed in the wormhole's "throat". They suggested creating this negative energy region by using the Casimir effect, a quantum effect in which long-wavelength vacuum fluctuations are suppressed in a region between conducting surfaces. Subsequent analyses showed that a Morris-Thorne wormhole would have to be of planetary dimensions, would require planet-mass quantities of negative mass-energy, and that the tidal forces created by the space curvature of the wormhole throat would be likely to destroy atoms (or people) attempting passage through it. Therefore, Morris-Thorne wormholes, while perhaps stable, cannot be considered to be transversable.

Matt Visser suggested a more user-friendly class of transversable wormhole. He describes a flat-space wormholes as produced by cutting holes in two separated regions of space time and then sewing the edges of the holes together with cosmic string. In other words, two joined regions of flat space are framed by a loop of cosmic string of negative mass and string tension. The cosmic string (another exotic artifact of general relativity) provides the needed negative energy. However, it is questionable (a) whether cosmic strings actually exist in our universe, (b) if they do, whether they can have negative mass and string tension, and (c) whether the tendencies of the wormhole to close up and of the negative-tension cosmic string loop to expand could be precisely balanced to produce a stable Visser wormhole. Therefore, neither Einstein-Rosen, Morris-Thorne, nor Visser wormholes appeared feasible for faster than light transport in our universe.

At this point let us inquire just what theorists like Einstein, Thorne, Visser, and Krasnikov are doing when they use mathematics to design a wormhole. General relativity provides us with a procedure for designing a wormhole (or any other space warp) by following these three steps:

1. Describe the kind of space-curvature that is desired by using a "metric", a symmetric 4×4 matrix that is a mathematical description of curved space-time.
2. Solve Einstein's equations for the "stress-energy tensor" (a mathematical description of how mass-energy from matter and fields is

distributed in space), such that the stress-energy tensor will produce the desired metric.

3. By successive approximations, find a configuration of matter and fields that will produce the required stress-energy tensor.

That's all there is to it. However, while many wormhole theorists have been able to carry out steps 1 and 2, the problem lies in accomplishing step 3.

Einstein's equations tell us that the stress-energy tensor needed to produce the metric for wormholes (and other space warps like "warp-drives" that are of interest to SF readers and writers) requires a large quantity of *negative* mass-energy that must be concentrated in a very small region of space. This violates what theorists call the "Weak Energy Condition" and has been viewed as requiring the existence of "exotic matter" having negative mass-energy. Unfortunately, all the matter and fields of our acquaintance have positive mass-energy.

The consensus today is that the requirement of negative mass-energy makes it impossible to construct a wormhole with normal matter and that some "exotic" material like Visser's negative-tension cosmic would be required. But the consensus may be wrong. Krasnikov has shown a third way of obtaining the negative energy needed to form a stable wormhole, which is something of interest to us. He demonstrates that the fluctuating energy of the vacuum itself can be used as the source of negative mass energy, so that the wormhole that can be constructed with only normal matter and fields.

Empty space, according to quantum mechanics, is not static and unchanging. As the quantum vacuum is examined microscopically by a variety of means, including extension neurosensing, at smaller and smaller distances, it is found that virtual particles with both positive and negative energies spontaneously appear and then disappear, their brief period of existence governed by Heisenberg's uncertainty principle. Krasnikov's calculations indicate that the negative energy part of this process is useful for wormhole engineering. Krasnikov separated the stress-energy tensor, developed in step 2 above, into two parts, one part from the mass-energy of quantum vacuum fluctuations and the other part

from the matter and fields that form the construction materials of the wormhole.

Krasnikov's calculations show for his particular kind of puckered wormhole that the second part of the stress-energy tensor (the non-quantum-mechanical part) has positive energy and therefore can be produced, at least in principle, using only ordinary matter and fields. And what is of interest to us, he has also shown that there is no particular size limitation to the new class of wormholes *and* that they could be made as large as is needed. Furthermore, it looks like for the new class of wormholes the requirement for exotic matter seems to have been lessened, with the quantum vacuum itself providing the negative energy contribution from quantum fluctuations of the electromagnetic field, the neutrino field, and the massless scalar fields. All of this brings Krasnikov's puckered wormhole to a human scale that are accessible to actionable levels, even though the curvature of space in the throat of the wormhole is peculiar - wrinkled or puckered like crepe paper, folded into sine-wave rings from the center to the edge to make a sinusoidally varying space warp. What is even more peculiar is that it is this very form that is also demonstrated by the human cell's aperture to the vacuum (looking very much like a Krasnikov-type miniwormhole, also known as a tube).

A **Krasnikov tube** is a speculative mechanism for space travel involving the warping of spacetime into permanent superluminal tunnels. The resulting structure is analogous to a wormhole with the endpoints displaced in time as well as space. The tube is a distortion of spacetime that can be intentionally created (using hypothetical technology) in the wake of travel near the speed of light. The Krasnikov Tube allows for a return trip that takes you back to the time right after you left. This several light-year long man-shaped "tube" might arguably constitute a megastructure, but unlike most megastructures it is not constructed of physical matter such as titanium or plastic, but instead is just a distortion of spacetime.

We now suspect that the experience with the RV was achieved through a Krasnikov-type tube that was initiated just before leaving the bridge we were then crossing and the return again to the location just

before arriving to the turn to another highway (left turn). The duration of stay in the California location was approximately 12 minutes, which would correspond to the time it would have taken the RV to reach the location where the RV would turn left to the new highway. Thus, the mechanism of interest to us appears to be such a tube – a Krasnikov tube. The ultimate question then remains. How did K'ai create such a tube while crossing the bridge? And how did he create the energy to access the tube in California to return to the initial location in northern Michigan? How did he get sufficient energy to initiate the tube and access the tube for the return? More importantly. . .

II

Can a human being or a network of human beings perform the same feat?

A. Where biology and physics meet: Time

This is the question that drives the writing of this essay. At this juncture, it is appropriate to bring our own research in what then we called sonobioelectrogravitic energetics. In 2009, several of us collaborated in the writing of the first essays in our *Biogeosystemics Series (The Sonobioelectronic and Sonobioelectrogravitic Nature of Life on Earth And Why Pilot-wave Subquantum Mechanics and Information Is Not Enough)* [7]. In it, we wrote:

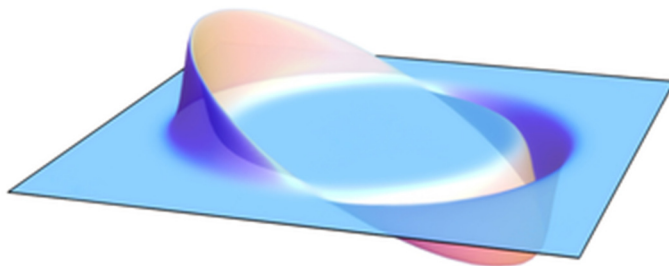
When it came to Life, the second law of thermodynamics looms large over the entire landscape. And entropy was the direction in which all things must go under an upward causal chain: left to its own devices, anything and everything would become disordered and, in the case of living things, die. Schrödinger, however, realized that living systems not only appeared able to avoid the effects of entropy altogether, but also to maintain and increase organization – which meant living systems were negentropic (producers of negative entropy, the *good* entropy). Then, in the late 40s and 50s, along comes

Albert Szent-Györgi (2), who recognized that energy and organization were closely and inseparably connected to each other, each deeply devoted to the other in a coupling and decoupling as thermal energy that becomes random thermal motion and free energy available for work. Living systems, however, often display adiabatic expansion, in which processes neither gain or lose heat. So the question of available and unavailable energy becomes blurred (p. 4).

In 1944, Erwin Schrödinger (whose quantum cat made him a near household name) asked the question, *What is Life?* And he used it as the title of a seminal book (1). His answer was dead on center, but did not go all the way to source. Is there really free energy? Schrödinger wrote,

"It is by avoiding the rapid decay into the inert state of 'equilibrium' that an organism appears so enigmatic....What an organism feeds upon is negative entropy."

And he went on to further clarify in a footnote that “negative entropy” to him was really “free energy.” More on this later.



Two-dimensional visual of the Alcubierre drive. Shows opposing regions of expanding and contracting spacetime that displace a central region

Causality and a Krasnikov metric. Krasnikov offered the concept of a tube as a way of solving the problem created by the warp drive spacetime problem developed by Alcubierre. The Alcubierre drive or Alcubierre Metric tensor is a

speculative idea based on a valid solution of Einstein's field equations as proposed by Miguel Alcubierre, by which a spacecraft may achieve faster-than-light travel, making travel to other stars more feasible. It is impossible for objects to actually move faster than light

within normal spacetime. However, rather than exceeding the speed of light within its local frame of reference, the ship would traverse distances by contracting space in front of it and expanding space behind it, allowing it to effectively move faster than light.

The Alcubierre metric defines the warp drive spacetime. This is a Lorentzian manifold which, if interpreted in the context of general relativity, allows a *warp bubble* to appear in previously flat spacetime and move off at effectively superluminal speed. Inhabitants of the bubble feel no inertial effects. The object(s) within the bubble are not moving (locally) faster than light. Instead, the space around them shifts so that the object(s) arrives at its destination faster than light would in normal space.

So what's the problem? And how does it affect what our objective(s) are?

The Alcubierre “warp drive” spacetime suffers from the drawback that a spaceship at the center of the warp bubble is causally disconnected from the outer wall of the bubble. Everett and Roman (1997) [9] argued and showed that the Krasnikov metric, originally used to solve the warp drive spacetime problem, requires that any modification of the spacetime to allow superluminal travel necessarily occurs in the causal future of the launch point of the spaceship. As a result, this metric has the interesting feature that the time for a one-way trip to a distant star is limited by all the usual restrictions of special relativity, but the time for a round trip may be made arbitrarily short.

In four dimensions this entails the creation of a “tube” during the outbound flight of the spaceship, which connects the Earth and the star. Inside the tube, the spacetime is flat but with the light cones “opened out” to allow superluminal travel in one direction, as seen by observers outside the tube. Inside the tube, the spacetime is flat but with the light cones “opened out” to allow superluminal travel in one direction, as seen by observers outside the tube. Although the creation of a single Krasnikov tube does not include the formation of closed timelike curves, Everett and Roman [9] showed that two spatially separated tubes could be used to construct a time machine – a feature shared by two-wormhole or two-warp bubble systems. This poses a problem for causality even if

tubes of only, say, laboratory dimensions could be realized in practice for causality even if tubes of only, say, laboratory dimensions could be realized in practice.

In terms of what we have planned, in a nutshell, it is fair to say that we are going to attempt to mimic K'ai's internal processes to achieve the objective(s) set out for this phase. While the argument that the two-wormhole or two-warp bubble systems may pose a problem for causality, this is not a concern in this operation. What is now of great interest to us is time.

In physics, time is described as a dimension much like length, width, and height. When you travel from your house to the grocery store, you're traveling through a direction in space, making headway in all the spatial dimensions—length, width and height. But you're also traveling forward in time, the fourth dimension. Space and time are tangled together in a sort of a four-dimensional fabric called space-time. When something that has mass—you and I, an object, a planet, or any star—sits in that piece of four-dimensional spandex, it causes it to create a dimple. This dimple is a manifestation of space-time bending to accommodate this mass. The bending of space-time causes objects to move on a curved path and that curvature of space is what we know as gravity. To punch a hole into the fabric of space-time would require a lot of energy, or negative energy - an exotic entity with energy of less than nothing (below zero-point). This means we need a way to tap the subquantum, where energy of less than no-thing exists.

Wormholes need this type of energy of less than no-thing. In spite of all the theorizing done here on Earth, there came someone we don't know where from, or when from, to show us that this *is* possible. The basic idea is that if you fiddle with the wormhole openings, you can make it not only a shortcut from a point in space to another point in space, but a shortcut from one moment in time to another moment in time. But we are in need of two kinds of wormholes: a microscopic one that can be used for us to tap into this ocean of energy that is the subquantum, and a macroscopic one big enough to fit the Earth through its mouth and be stable to bring the astronomical object through the tube

to another point in space along a timeline that is Earth's. In other words, we need to bring the Earth to a future time.

How could that be done?

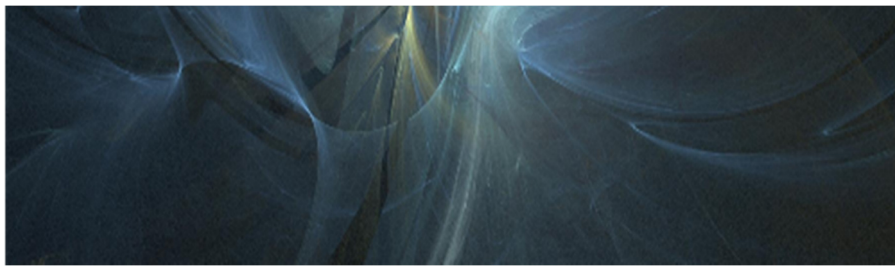
One of the things K'ai told us then was that he was "going to find a string" to use for his demonstration. Interestingly enough, cosmic strings are narrow tubes of energy stretched across the entire length of the ever-expanding universe.



Vibrating strings - Artist depiction

Supposedly, these strings as skinny regions, leftover from the early cosmos, are predicted to contain huge amounts of mass and therefore could warp the space-time around them. But K'ai may not have made use of one such, but another that is an equally skinny region that abounds in *normal* spacetime – which is how he described the string he was looking for – a loop

that has no end. So, we can liken them to spaghettis or SpaghettiOs. The approach of two such strings parallel to each other will bend spacetime so vigorously and in such a particular configuration that might make our purposes possible.



Let's suppose that we can gain access to one such double string. Once accessed, how do we gauge

time. What is time, in the first place? In physics, time is defined by its measurement: time is what a clock reads. It is a scalar² quantity and, like length, mass, and charge, is usually described as a fundamental quantity. (See Note 2 for more information). Time is also energy, as Nikolai Kozyrev would have us see. He was a Russian astrophysicist, who died in 1983. He has "demonstrates through gyroscope experiments

the fact that time-energy can be transferred to the experimental system. It is also proposed that the energy of the system can be transferred to time-energy. In other words, the time flow can be accelerated or decelerated by means of energy exchange with a special asymmetrical mechanical or electrodynamic system” [10]. What Kozyrev called *time* and *time flow*, we call *sub-quantum energetics*; others have called it dark matter, dark energy, virtual particles, vacuum flux and zero-point energy.

4. Time

Kozyrev calculates the qualities of stellar matter where it functions as a transformer of time-form energy into heat-energy. It is concluded that the transformation involves several electrodynamical processes, but, generally, any closed mechanical system can produce energy also if it is an asymmetrical system. The asymmetry for mechanics by Kozyrev is cause-effect asymmetry and if the mechanical system includes the non-reversible cause-effect connection it can take the energy from time-flow.³

He says,

Time in the universe is not propagated but appears immediately everywhere. On a time axis the entire universe is projected by one point... It seems to us that such a possibility of the instantaneous transfer of information through time should not contradict the special theory of relativity -- in particular, the relativity of the concept of simultaneity (see unpublished article by Nikolai. A. Kozyrev, Russian, September 1967, p. 29) [10].

Although Kozyrev didn't explicitly use these words and referred generally to time as a phenomenon of nature, I think an interpretation along the line of time-energy field is much closer to his ideas. This is

supported by yet another property that Kozyrev ascribed to time: the *density of time*. Though much debated by Russian physicists, we can say that time has some kind of energy or more precisely a kind of negentropy which is quantified by its density.

Kozyrev imagined that matter generally can emit and absorb time in the form of this energy. When a material body emits time its entropy (disorder) increases whereas when it absorbs time its entropy decreases or in other words its negentropy (order) increases. In order for time to transform a cause into a result, the material body representing the cause emits this time-energy/negentropy and the material body representing the effect absorbs it.

All this may seem bizarre to someone unfamiliar with Kozyrev's work but Kozyrev actually supported these results with a series of experiments (for an extensive review of Kozyrev's experiments revealing the active properties of time see the work of Levich) [11] [12]. It is not just time acting on matter but it's more of a mutual interaction.

Kozyrev thought of time as "a mighty flow embracing all the material processes in the universe, and all the processes taking place in these systems are sources feeding that flow" [10] As a field, time fits the bill for a kind of pilot-field: it has velocity, energy, density and it interacts with matter.

Let's remember also that Bohm developed his theory which produced exactly the same results, but with standard quantum theory, although the difference from my viewpoint is that in Bohm's theory, a quantum potential arises completely unsuspected by standard quantum mechanics, and this potential manages to give an excellent causal explanation for all observed quantum phenomena, unlike what the standard interpretation could.

Finally, let me say that Kozyrev's theory is ignored, in spite of having one of unique physical intuition and perception, with experiments that seem to substantiate some of its predictions. Perhaps this is so because it lacks a more precise mathematical formulation, although this is more of a secondary thing than anything else.

The history of science is implacable in this regard: when there is a solid physical basis, mathematics will find a way to express it. The same

goes for the underpinnings of the theory of idiomaterial physics, which I invented from the physical results obtained with a gnosive technology supported by physical technology.

The foregoing then does make a compelling case for what we wish to do, as I will argue next.

III

A theoretical model for an active framework for gnosive actionable solutions

The model we propose in this essay is what I and others have called *biogeosystemics*, or a systems approach to the energetic interaction between the Earth, biological life on its surface (including, and most especially human COBEs [complex oscillating biological entities]), and flow-of-time as subquantum energetic source to human life, energy which suffuses not only all life on Earth but all matter on Earth and in the universe. Biogeosystemics works well as a scientific metaphor, especially when we see others running amuck of deficiencies and insufficiencies. Thus, while metaphors are good as guiding mental mechanisms, they may or may not have isomorphic (one-to-one) correspondence to the phenomenon they attempt to describe. In other words, the map may likely not be the territory, even though the map is found useful.

The often cited *particle model* of the atom is seriously flawed. Just as Einstein's theory of relativity suggested, all of physical matter is ultimately made of pure energy, and there are no *hard particles* to be found in the quantum realm. Kozyrev's work has now led us to see all physical matter in the Universe as if they were *sponges* that are (and have been) submerged in a water-like (or fluidic) ocean of energy for a long period of time such that they are saturated with this energy.

Does the map match the territory? This is an empirical question, asked in this sense: Can we act in, through, with, or otherwise on this energy to create a physical effect? And does acting on this energy (the territory) measurable effects? We have found out that the answer to both questions is, yes!⁴ Biogeosystemics tells us it is possible. To understand the idea, please lend me your imagination. Together, we are going to examine visually the conceptual framework of this model. See the human being on the surface of the Earth, on the northern hemisphere, more specifically North America – the image on below? The human form actually belongs to a live human being, a male athlete.



He is in interaction/interface with a host of experiential streams in 4-spacetime as well as in subquantum. This human is a COBE (complex oscillating biological entity) whose body exists in a variety of timelines. These timelines are markers for cellular changes in the body. In the model we are building, the interaction of interest is his cellular connectivity to subquantum energetics, which is also affected by both location on the Earth, time of the month, and season of the year –

fluctuations which are in keeping with the fluctuations of time-energy or vacuum inhomogeneity caused by uneven distribution of matter in the solar system and in the known universe. How could a human COBE act upon the time-flow or subquantum/vacuum energy? Can we connect to this source of energy with our biological make up?

Again, the answer is yes.

Lyrans gnosive technology, according to K'ai, is responsible for feats of not just planetary and star system engineering but also for galactic engineering as well. A parting shot to us from this person before leaving was that the only difference between us the Lyrans was that they didn't know it was impossible to do such kind of engineering. And we did. So, there it is: unlearning, all over again; then relearning what we have already that we don't know we have in us. Let's have a look at things from the ground up.

1. A genetic framework of possibilities: DNA as the transducer of information as energy

We as information clouds transduce our energy as information through sonobioelectrogravitic migration, whereby the emergence of consciousness is transmuted as information manifestation into 4-spacetime where it then literally becomes reality. Not just the reality of a biological existence and all of the resulting mechanical and biochemical interaction processes with its environment, but also the very perception of biological existence itself.

In addition, the same pathway is used to transduce acquired information into the information cloud. At the center of this, a COBE's DNA figures prominently as interface or hub for existence and its perception. To assume a rigid, predetermined hand of genetic cards dealt at the beginning of one's prenatal existence is unfortunately still today's view of the standard model. Nothing could be further from the truth. A gene is a biomolecular unit within a nucleic acid molecule that codes for a polypeptide or RNA sequence. Genes can promote, inhibit or otherwise modulate each other's expressions, while being also greatly

influenced by epigenetic factors in doing so, a matter that finally starts to play an increasing important role in healthcare research. Although pointing in the direction of exonic activation, it does not account for all of the role of the vast amount of so-called non-coding intronic DNA parts, often quoted as “junk DNA”, which constitute the majority of genetic material in homo sapiens sapiens.

Actually, if one was to assume that DNA was in fact a kind of tuning fork or antenna for electromagnetic interactions, that would constitute in an antenna of more than 100 trillion meters length for every human COBE. It is for that major DNA part that so-called memes are of

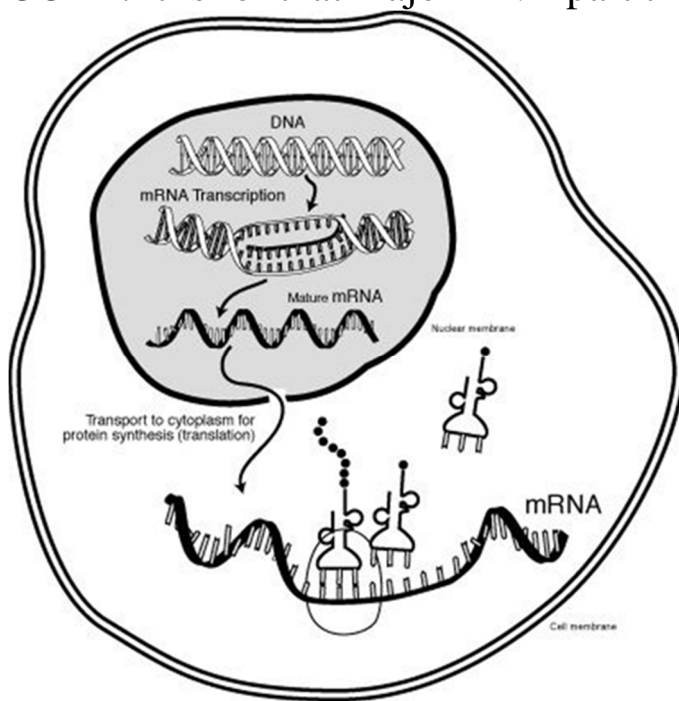
significance.

A meme can best be understood as an information unit, however going way beyond the comprehension of solely pure biochemical information. It suggests a strong memetic code interaction of intra- and extracellular structures with language, habits, talents and even cultural aspects.

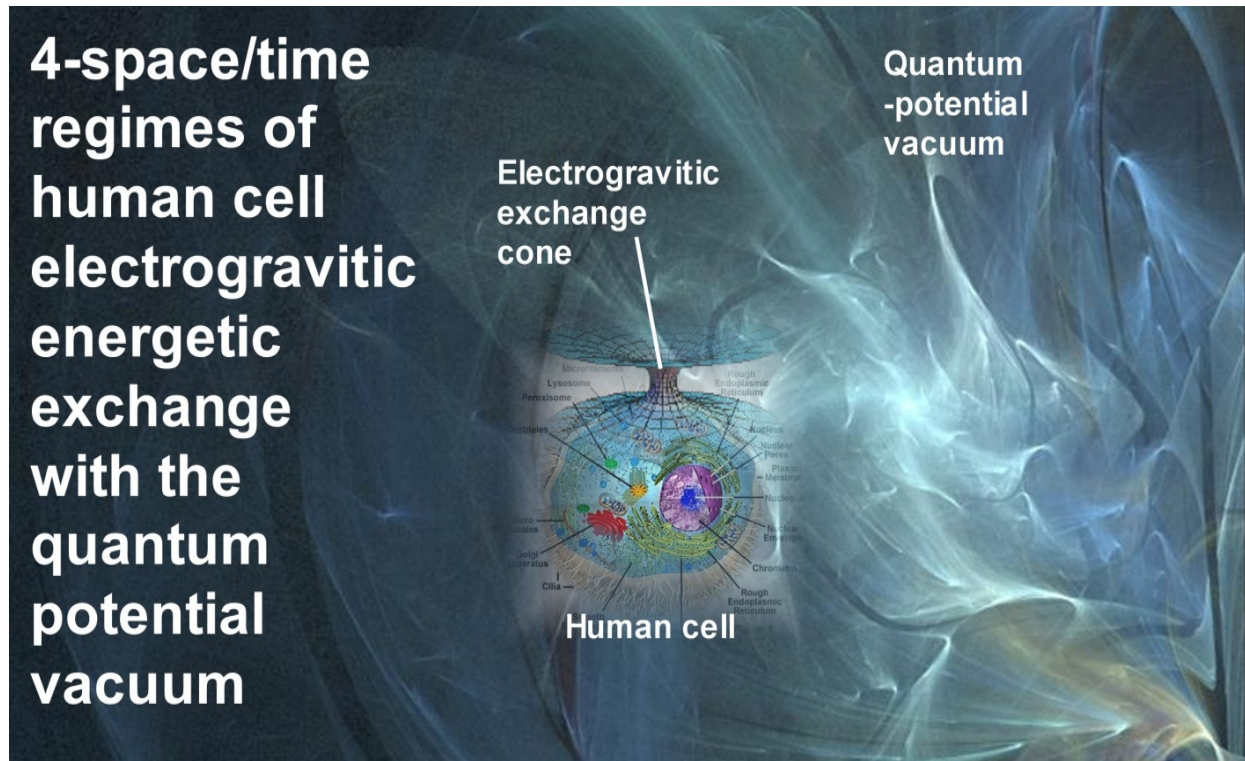
Information units then can be added, subtracted or modulated without obvious alteration of

the exonic-coded bioelectromagnetic matrix’s anatomic and physiologic functioning of the body. For this to be understood one must take more intra-and extracellular structures into account for information processing than just exonic or even intronic DNA.

Structures like cellular membranes and the lipid bilayers found within the (smooth and rough) endoplasmatic reticulum, Golgi apparatus and mitochondria, are of major importance. The close juxtaposition of membranes and nucleic acid molecules, down to the range of mRNA or even tRNA, strongly indicates a vivid and imperative interaction of EM fields with nucleic acid molecules, leading to the perspective that



memetic encoding might not solely take place within introns of DNA, but that information is apparently stored, retrieved or otherwise modulated in many places, like lipid bilayers, acting as EM capacitors or even hard-drives for information processes.



Although highly suggestive for an all-electromagnetic basis for information management, it does suggest another type of vibrational information system at first sight – namely sound. Therefore other cellular components become more indicative, like microtubuli. Their capacity for resonant harmonics throughout the cell and even via intercellular connection hubs, like desmosoms, are perfectly suited for not only conduction of vibrational information but also for its storage and modulation. It is then so that memetic encoding is not just confined to intronic DNA, but rather takes place within almost all intra- and extra-cellular components transducing information via tissue interconnecting structures, like collagen fibers and fascia, which surround almost all

types of organs and therefore assure interconnectivity of the organismic cellular collective, in sonobioelectronic fashion.

As the Standard Model's regrettable distinction between electricity and magnetism might just be a little bit arbitrary, so could be its point of view regarding electromagnetism and sound as separate phenomena concerning energetic information. Indeed, they are both aspects of vibrational energetics and therefore perfectly suited for information processing.

The body's orchestrated synergism in that regard is only surpassed in efficiency by its quality of superconductivity. Besides its piezo- and pyro-electromagnetic capabilities to interact with and translate informational energy as interface between "outer 4 spacetime" and the inner organs of the body, in either way - and still in 4 spacetime - the integument shares a common - and one might also therefore say purposeful - ontoembryonic heritage with its ectodermal central and peripheral nervous "relative" in processing vibrational energy.

Again, this does not mean that for informational exchange with the information cloud, our 4 spacetime matrix is restricted to any nucleic acid structure at all. Any above-mentioned component, being idiomaterial itself in nature of course, dances the Texas-2-step with its quantum templaic "partner" and so contributes likewise with processing and exchanging information directly within the entire biomind. The preferably complete acquisition of information - arguably at this stage in a time-linear way - is essential for tautologic refractivity. But furthermore, the range of the electromagnetic spectrum vastly extends beyond gamma rays and is really not confined just to EM properties. Every electrically charged molecule not only maintains an EM field but also contributes in creating an inhomogenous gravitic medium, especially as protons flow across interstitial space between cells.

We therefore agree with the statement, made elsewhere [15], that ***the body's properties are sono(photo)bioelectro(magneto)gravitic in nature.***

The so-resulting laser-pumped irradiation of DNA leads to radiowave emissions of the latter (the known EM spectrum might also not end with long waves either, after all) eventually contributing to the creation of a

temporary wormhole and therefore opening a direct access to the vacuum for negentropic interaction. Combined with the above mentioned micro-tubular resonance of the entire organismic cellular collective, the biological matrix's genetic and memetic information banks now open up to unisonic vivificative interaction with the vacuum plenum in a share-distributable exchange of informational energy, essential for reparative and adaptive processes. In addition, this exchange is subject to vectored-intentional subconscious and conscious interface.

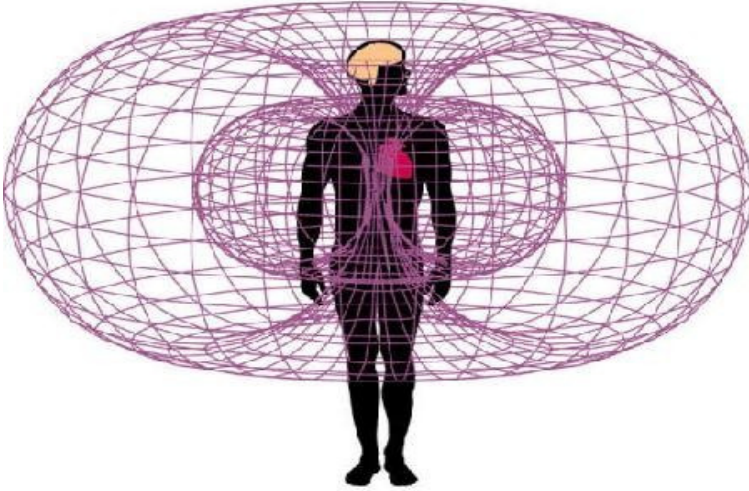
One might thus be tempted to shirk off any possible unfavorable influences by the “construct” of 4 spacetime. However, medically speaking, this is not to say that biochemical processes involving cancerogenic substances, ionic imbalance resulting in chronic tissue pH reduction, detrimental nutritional factors or even physical, mental and emotional stress, are not to be taken into account. They are, and not doing so would also much constitute in denying the laws of idiomaterial physics [15].

After all is said and done, at the core of all of this remains the role of DNA in the trans-Planckian transduction role of correct “guidance” and application of quantum vacuum energy.

Since the mid- to late-1970s, pioneering biophysics work has shown living tissues to interact with electric and magnetic fields in unexpected and dramatic ways. From early anecdotal accounts of enhanced healing under electromagnetic stimulation, research has progressed to a sophisticated set of investigative tools and theoretical models, including among others polarized light microscopy to study the liquid crystal properties of living cells and laser-excitation of DNA as means to induce hybridization through non-molecular information transfer.

In almost all cases, the results point to a set of remarkable properties of living tissues, and in particular of genetic material: the emerging picture is that of biosystems as sources and domains of coherent electromagnetic fields, which account for practically instantaneous inter-cellular communication and a highly efficient mechanism of energy utilization, and which seem to reflect very closely the developmental and physiopathological state of the organism. Sidorov and Chen [16] also

report on the presence of the human operator in the mix: an impressive



number of studies done within a Cartesian scientific framework as parapsychology and mind-body medicine converge to show that conscious intent can affect practically every single every single type of genetic program, as well as many physiological

parameters [19]. They also show that such effects can be produced from great distances, and that occasionally they are accompanied by unusual energy signatures. The question: Is there a correlation between the effects of electromagnetic fields and those of mental intent on genetic regulation and living tissues?, is discussed at length in [15].

In our shop, we've been looking at the conjunction of causal templates by experimental, modeling, as well as gnosive means [15], in view of the bicausal/bitemplaic nature of Nature itself according to our emergent Working Model [17], [18]. In this vein, experimental, model and gnosive data show us that an observer exercising integrated observership on an idiomaterial Earth of a Unum/Universe can and does affect macroquantum reality matrices when, and if and only if, the integration of observer and local universe medium (bitemplaic/bicausal) is a workable continuum. A human observer becomes an integrated observer when, and only if, an individual's alignment of biomind (body fields + mind field), intention with a coherent vector, and holomovement in spacetime from within the human overfunction is a workable, working continuum for the duration of the holomovement as action in spacetime. When both integrated observer and local universe medium align, a merkabaic geometry becomes possible for however long the observership moment lasts.⁵

It is in this instant of time that the digital video capture of the observership moment shows a rapid, near-instantaneous realignment of

antiMeissner field configuration from the octaval (harmonic) positions away from the surfaces of the emitting human biomind into a double torsionic configuration concentrated around the mid-thoracic area (dorsal and ventral) of the body (see image on previous page, representing the form). This is a phenomenon predicted by the Working Model but yet not fully understood in terms of human COBEs. It is quite possible that it is this phenomenon that McCraty and others at the Institute of HeartMath have captured during their studies of the heart field. Regardless, the biophysics of thought, thinking and mental activity is what now enters into the conceptual equation here now. This comes through the work of Dr. Jose Delgado.

2. For every function, there has got to be a driver

There is the brain and human nervous system, and then there is the driver that makes things possible. Together, they power the human mind, up or down.

In “a dramatic demonstration of mind reading, neuroscientists have created videos of what a cat sees by using electrodes implanted in the animal’s brain. ‘Trying to understand how the brain codes information leads to the possibility of replacing parts of the nervous system with an artificial device,’ he said.” [20] The scientist commenting on this technology saw the future possibility of brain activity mapping being used in creating electronic components to replace damaged parts of the system. The use of mind mapping had other possibilities as well. Similar research was pursued by Dr. José Delgado at one of the country’s leading research institutions in controlling the behavior of humans and animals.

The use of mind mapping had other possibilities as well. Similar research was pursued by Dr. José Delgado at one of the country’s leading research institutions in controlling the behavior of humans and animals. Actual testing of certain systems proved “that movements, sensations, emotions, desires, ideas, and a variety of psychological phenomena may be induced, inhibited, or modified by electrical

stimulation of specific areas of the brain” [21]. By 1985, Dr. Delgado was able to create these effects using only a radio signal sent to the brain remotely, using energy concentrations of less than 1/50th of what the Earth naturally produces. This discovery implied that frequency, waveform and pulse rate (modulation) were the important factors rather than the amount of energy being used.

In considering this it makes sense because the human body does not require high electromagnetic power concentration to regulate its normal functioning – the key was in finding the “tuning” mechanisms for locating the right “receiving station” in the brain.

By 1998, publicly released information was being discussed as a result of information openly flowing out of Russia. A meeting was held to assess the threat: the “main purpose of the March meetings was described in the *Psychotechnologies* memo as to ‘determine whether psycho-correction technologies represent a present or future threat to U.S. national security in situations where inaudible commands might be used to alter behavior’ ” [22]. The threat assessment was likely to begin to condition Americans for the public acknowledgement of one of the government’s long held secrets – the human mind and body could be controlled remotely without a trace of evidence being left behind.

3. Control of the Mind and Body

The predominant brain wave frequencies indicate the kind of activity taking place in the brain. There are four basic groups of brain wave frequencies which are associated with most mental activity. The first, beta waves, (13-35 Hertz or pulses per second) are associated with normal activity. The high end of this range is associated with stress or agitated states which can impair thinking and reasoning skills. The second group, alpha waves (8-12 Hertz), can indicate relaxation. Alpha frequencies are ideal for learning and focused mental functioning. The third, theta waves (4-7 Hertz), indicate mental imagery, access to memories and internal mental focus. This state is often associated with young children, behavioral modification and sleep/dream states. The last, ultra slow, delta waves (5-3 Hertz), are found when a person is in

deep sleep. The general rule is that the brain's predominant wave frequency will be lowest, in terms of pulses per second, when relaxed, and highest when people are most alert or agitated [23]. External stimulation of the brain by electromagnetic means can cause the brain to be entrained or locked into phase with an external signal generator.⁷ Predominant brain waves can be driven or pushed into new frequency patterns by external stimulation. In other words, the external signal driver or impulse generator entrains the brain, overriding the normal frequencies, and causing changes in the brain waves; which then cause changes in brain chemistry; which then cause changes in brain outputs in the form of thoughts, emotions or physical condition. As you are driven, so you arrive – brain manipulation can be either beneficial or detrimental to the individual being impacted depending on the level of knowledge or the intentions of the source controlling the technology.

In combination with specific wave forms, the various frequencies trigger precise chemical responses in the brain. The release of these neurochemicals causes specific reactions in the brain which result in feelings of fear, lust, depression, love, etc. All of these, and the full range of emotional/intellectual responses, are caused by very specific combinations of these brain chemicals which are released by frequency-specific electrical impulses. “Precise mixtures of these brain juices can produce extraordinarily specific mental states, such as fear of the dark, or intense concentration” [23].

Unlocking the knowledge of these specific frequencies will yield significant breakthroughs in understanding human health. Radio frequency radiation, acting as a carrier for extremely low frequencies (ELF), can be used to wirelessly entrain brain waves. In 1990, the results of a study strongly indicated “that specific types of subjective experiences can be enhanced when extremely low frequency magnetic fields of less than 1 milligauss are generated through the brain at the level of the temporal lobes. Vestibular feelings (vibrations, floating), depersonalization (feeling detached, sense of a presence) and imaginings (vivid images from childhood) were more frequent within the field exposed groups than the sham-field exposed group” [24].

In another 1996 “new age” invention, quartz crystals are used to create stress relief by slowing brain activity. “Physiological stress in a human subject is treated by generating a weak electromagnetic field about a quartz crystal. The crystal is stimulated by applying electrical pulses of pulse widths between 0.1 and 50 microseconds each at a pulse repetition rate of between 0.5k and 10k pulses per second to a conductor positioned adjacent to the quartz crystal thereby generating a weak magnetic field. A subject is positioned within the weak magnetic field for a period of time sufficient to reduce stress” [24].

Consciousness training is also a big theme in cults, religious organizations and others pursuing the “new age.” Science has now gained a greater understanding of how the mind and brain work so that what used to take years, or even decades, to achieve, can now be mastered in weeks, days or even minutes. For instance, in 1996 a method and apparatus for the use in achieving alpha and theta brainwave states and effecting positive emotional states in humans,”²³ was developed. Two years later another patent was issued which could create desired consciousness states; in the training of an individual to replicate such states of consciousness without further audio stimulation; and in the transferring of such states from one human being to another through the imposition of one person’s EEG, superimposed on desired stereo signals, on another individual, by inducement of a binaural beat phenomenon” [24]. Thought transference?

The preceding leads us to a conceptual and practical platform for human performance that can best be referred to as *human integrated functioning*.

Everything we learned from all sources – experimental, quasi-experimental, gnosive, SQUID observations, and field experiments – went into a modeled basis for human integrated functioning. The model is dynamic/interactive-interface between an IFH-COBE in his/her environment(s) (internal and/or external) and an object/process/condition/entity of focused interest.

To summarize findings, human integrated functioning is **observership** applied by a human being to a range of interests supplied and supported by abilities manifest as media, means, and behavioral expressions of the specific observership.

Another way of describing this observership would be to say that it is heightened awareness applied to a range of interface/interaction simultaneously internal and external interests. The operationalization of the abilities as capacity is unique to the individual. In all cases seen thus far, it is a range of expression learned as internal process of heightening awareness and conscious education that is both enteric and intellectual – simultaneously – aimed as conscious choice(s) on know-how, knowingnesses, and performance related to the chosen range of expression.

Thus, an IFH-COBE functioning within a benevolent framework is capable of using, manipulating and accessing EM/scalar signatures, entangle them to specific change regime, use and manipulate a full spectrum Maxwell radionics, use an educated enteric brain operating as his/her human biocomputer-like conduit for initiating a recipient's autubiocorrection cascade or any other self-help regime. There are other kinds of operating frameworks associated with both naturally-evolved IFH-COBEs and technologically-assisted human COBE extensors. While these applications are within the operating model of an IFH-COBE, discussion of them here is beyond the scope of this essay.

A biologic basis for IFH-COBE status. The biologic platform on which IFH-COBEs stand lies on the functioning of the COBE's autonomic nervous system that is the basis of the human enteric brain. It is a dynamic platform which the IFH-COBE sets up, manipulates and uses automatically and on demand, according to situational-context performance needs. The human autonomic nervous system is actually a vibrant and dynamically coordinated arrangement of two opposing system-performance frameworks; one is that of the sympathetic nervous system (SNS); the other is that of its opposite – the parasympathetic nervous system (PNS). When out of balance, the human COBE may experience acute or chronic problems that take its optimum functioning

range either into an SNS dominance, or a PNS dominance. From a integrated functioning point-of-view, dominance by neither is desirable. What is optimal is a dynamic balance. Let's examine briefly what each brings into a COBE's dysfunction.

When the sympathetic nervous system (SNS) is stronger than the parasympathetic nervous system (PNS), the COBE is prone to be tense, to less appetite, to insomnia, to situational/acute attention deficiencies, to psychological defensive postures (internal and external), to anxiety, and so forth. When the opposite sets in, and the PNS is stronger than the SNS, a COBE will be prone to sleeping heavily, have strong appetite, feel dull, have rather high pressure (or higher than normal BP) etc. These are broad, general statements used to clarify patterns.

The systemic functioning between PNS and SNS is at the crux of the state of consciousness which would support the kind of observership of which we speak, especially when we match the observership requirements to the requirements of a gnosive actionable of the type envisioned in this essay. Obviously, at the level of development we humans are at this juncture, one human being would not be enough to generate the conditions required by a Dyson-type solution. So to what is the preceding connected to as conceptual and theoretic substance for the development of an actionable gnosive planetary engineering platform?

I propose here that we humans of Earth take a page out of the K'ai discourse with three of us (Solingen, Traveler and I) and use Lyran gnosive technologies to perform a Dyson-type solution to the problem anticipated by the occurrence of (1) direct exposure to the anticipated Level 3-5 superwave and (2) the near-simultaneous and concurrent extinction-level solar flare accompanying the galactic event.

IV

A practical model of an active framework for gnosive actionable Dyson-type solution

What follows in this final section is a thought experiment, albeit one that can be done, provided there is the willingness muscle to conceive, group, organize, and provide guidance to the set of participant pairs required to conduct the experiment. This is, without any doubts, a gargantuan endeavor, yet one that is conceivable and one that can be elevated from the realm of science fiction to the probability of a human realization of will as gnosive performance of vectored intention. This thought experiment is nothing short of planetary engineering, and the method proposed for carrying it out is not from this planet. It comes from a group of planets populated by human form beings who were once like us, but who now are as a group a Civilization Type IV in the Kardashev scale. It is further said by an informant who is said to have come from the Lyra Constellation (namely the star Vega, planet with an unpronounceable name).

The *Kardashev scale* is a method of measuring a civilization's level of technological advancement, based on the amount of usable energy a civilization has at its disposal. The scale has three designated categories

called *Type I, II, and III*. A Type I civilization has available all the energy impinging on its home planet, Type II all the energy of its sun, and Type III of its galaxy. The scale is only hypothetical and in terms of an actual civilization, highly speculative; however, it puts energy consumption of an entire civilization in a cosmic perspective. It was first proposed in 1964 by the Soviet astronomer Nikolai Kardashev. Others have extended the scale to even more hypothetical Type IV beings who can control or use the entire universe, or Type V that control collections of universes. Metrics other than pure power usage have also been proposed, such as *mastery* of a planet, system or galaxy rather than considering energy alone, or considering the amount of information controlled by a civilization rather than the amount of energy.

A. The Thought Experiment that can save the Earth

The thought experiment would have two concurrent phases in this timeline (local time/space) and two correlative phases in a level manifestation of dimensions higher than 3-space and 1-time, neither linear nor local to the concurrent phases in this timeline.

1. Concurrent phases in this timeline. Imagine for a moment that an x number of people – human beings living on Earth – agreed to pair up for the purpose of participating in the human modeling of a gnosive actionable Dyson-type solution. Let's further say that at the very moment you are reading this sentence, the world is populated by 7,072,800,000 human beings. A 3 percent of this total would be 212,184,000, give or take a few hundreds of thousands. The population figure is a dynamic one, meaning that it is constantly changing upward.

To see it, please visit <http://www.worldometers.info/world-population/>.

So, we choose a base of 7 billion, 72 million, 800 thousand human beings, and derived 3 percent from that, which gives us 212,840,000 souls.

Let's further say that this number of people, distributed across the planet, would constitute a *Dyson human network* made of 106,092,000

pairs of souls or information clouds paired for a vectored-intentional actionable. The distribution across the planet can be expected to follow a normal curve in abilities, strength of vector intention and physical distribution on the planet's surface. This lets us set up a network large enough to be a veritable *Dyson gnosive sphere* on the surface of the Earth, especially if and when 106,092,000 human pairs located around the Earth come together either in real time (in parallel) or in various sequences in our timeline (in sequences nonlinear/nonlocal to each other).

Vectored-intentional actionable. The vectored-intentional actionable is the drawing of subquantum energy by way of a procedure devised and developed by LPGC, known as cell-talk [7]. Cell-talk is a procedure originally devised for use in healthcare applications involving pain management. As a healthcare application, cell-talk is an auto-regulative approach to pain management and cellular repair designed to use a Priore effect by generating a microscopic torsionic whirl in each cell in and through which a microwormhole connects to the vacuum on an auto-regulative basis, drawing energy to populate a cell's energetic vacuum pump (the torsionic whirl) which serves as reconstituting medium for the cell.

This procedure is also useful for Chi masters and Qigong practitioners who draw energetics through breathing exercises, but who actually use the cells of their lungs to set up a vacuum pump to draw energetics from the vacuum. For many years, it had been said that Qigong masters drew Qi or Chi through breathing. However, the biophysics of the process indicates now that the energetic sourcing is actually from the vacuum, and not simply oxygen from the air.

Thus, the procedure for this vector-intentional actionable is well established, even though much more experimental work is needed to advance understanding of the process, the procedure, and its effects at the cellular level, and on how the human body interacts with this energy source.

This, however, will not preclude the use of this procedure as a means to a vectored-intentional actionable. It fulfills all of the requirements of such kind of actionable: it is auto-regulated; it is controlled by the user;

it is vector-able, meaning that (as many Qigong practitioners will attest) it can be directed intentionally to any location in space/time and time/space. Recent LPGC clinical and quasiexperimental work also indicates that Qi-as-vacuum-energetics can successfully be directed nonlinearly to a nonlocal relative location by a human being who does not need extensive training in Qigong or Qi manipulation. The clinical evidence indicates that the human body appears to already have built-in means to co-locate such energetics in both line-of-sight and nonlocally-nonlinearly with high precision. The evidence indicates that this co-location is automatized by processes indexed to the time/space regimens of the body's cellular/genetic make up.

So we use this extended human function to advantage.

Energetic co-location. Each member of the pair would be instructed on how to use cell-talk with precision to perform the following: (a) draw vacuum energy through each of the cells of the body. The pair member would also be instructed on how to (b) direct this energy nonlinearly to a nonlocal platform to deliver the flow to the relative energy depot for use in the correlative phases at dimensionally higher levels of manifestation. The energy harmonically resonated to the level of manifestation which is the locale relative to the point in local space/time where the Krasnikov tube would be initiated.

In real time, how would this be done? A time table for execution of these phases would be something like this:

Time table for this would begin 15 December, 2012. Three energy generation and delivery phases would be set up as follows:

Phase 1:	December 16-December 28, 2012	(Active)
Intermezzo:	Dec 29-31, 2012	(Rest)
Phase 2:	January 1-12, 2013	(Active)
Intermezzo:	Jan 13-15, 2013	(Rest)
Phase 3:	January 16-28, 2013	(Active)
Reporting	January 29-February 1	

A reporting website would be established early on and made public along with all information necessary for self-governing pairs to be viable from the very start. Another marketing idea is to have pairs market to prospects – friends of like mind. I'm willing to bet that those in the 3-

percentile are the ones who will know others of like-mind who would be attracted to the idea and the intent of this phase.

Pairs are to do this for a total of three phases: three periods of 12 days each, for a total of 36 days. Each phase is to be done with three days separating the first from the second, and the second from the third. When each session is done is to be determined by members of a pair. The pair is self-governing, and only informs a reporting website that their pair-work is finished when it is all done (if that is still possible at the time). When done and reporting is done, pair-work responsibilities are over.

2. Correlative phases in a level manifestation of dimensions higher than 3-space and 1-time. The vacuum energetics generated and transferred nonlinearly/nonlocally by pair members is harmonically resonated to a platform keyed to the heart chakra signature. This relative location would be the locale relative to space/time where the Krasnikov tube would be initiated. The opening would be energetically populated by the subquantum energy forwarded by pairs. Platform work begins from first receipt of energetics until all pair procedures yield whatever level of results generated by all participant pairs.

3. Krasnikov time displacement. The proposed Krasnikov time displacement is actually a dislocation of timeline for the entire planet. What is proposed in this thought experiment is the transduction of an entire planet from a common-timeline-present (CTP | α) to a transduced common-timeline-present (CPT | α') via a Krasnikov tube. The objective of this procedure is to translocate an entire planetary body from one local time to another local time within the same relative local space (solar system). The second phase of this procedure is to use the planet-surface Dyson-solution generated energetics to return to a new CTP | α several decades ahead from the previous one. Why perform all this? To avoid catastrophic timeline events associated with extremely severe solar weather exacerbated as a result of magnetic effects generated by superwaves of Magnitude 3 and Magnitude 4, forecasted to occur within the next several centuries.

4. Building a Krasnikov tube by Dyson-solution generated energetics. This thought experiments conceives the possibility that a Dyson-solution can be a useful and viable key to the generating of sufficient energy of the right kind to populate the entry- and exit-points of a Krasnikov tube, without requiring a Casimir contraption to access energy from the vacuum. It is also likely that in the case it is ever attempted, there will be a need of experienced hands at getting the entire structure put together. Assist would have to be sought through K'ai and those who have experience in this process.

IV

Some

Final thoughts

About A

Thought Experiment

The plain English definition of a *Thought Experiment* would lay in the realm from wishful thinking to science fiction. Yet, idiomaterial physics treats it as a viable, useful, and possible experiment. In this essay, we explored the physics (standard and idiomaterial) – the elements, which considered together as a possible actionable frame – that make can it possible.

Thought experiments are fun because they stimulate thinking beyond the information given. It stimulates us to think outside the physical box of standard physics, as it were – if the idea of planetary engineering and Krasnikov tubes were to be so. Nevertheless, I submit it for serious consideration because there were three of us from the Life Physics Group who experienced what could only be a phenomenon which used a Krasnikov tube several years ago. The man who made it happen said he was not from Earth. We took his word with a grain of salt. But upon being in Michigan one moment and California the next made the question moot. He was definitely not from here. So the three of us now

treat this possibility as real, and I then decided to write this essay as a consequence of the experience and the conceptual/theoretical framework I now believe to have made that experience possible and real.

Acknowledgment

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Notes

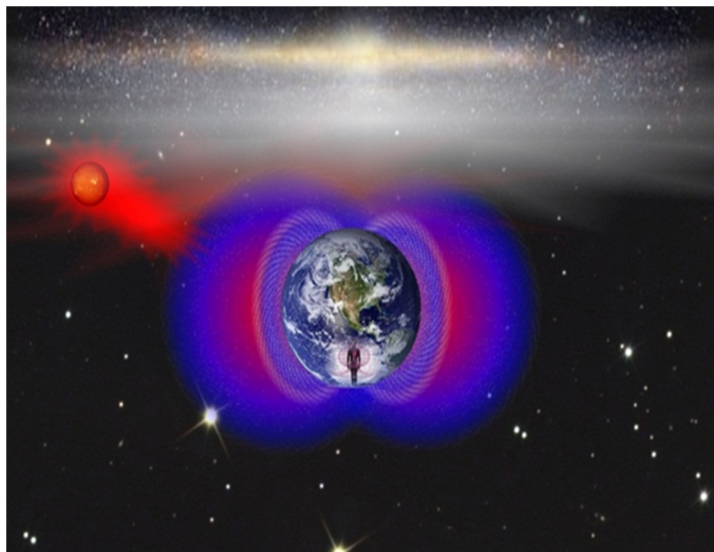
1. Galactic Superwave Event Ranking: There are four levels of magnitude described by LaViolette on his <http://www.etheric.com/GalacticCenter/nextevent.html> page. See the page on *Questions and Answers Regarding What the Next Superwave Might be Like*.

Magnitude 1: A superwave cosmic ray burst that is not detectable above cosmic background levels but which carries a gamma ray burst and gravity wave pulse at its forefront. This would likely produce seismic and EMP effects

much stronger than the December 2004 earthquake and gamma ray burst.

Magnitude 2: A short duration superwave cosmic ray burst that produces a moderate increase above cosmic background levels and a minor climatic disturbance. This would be similar to the events that

occurred around 5300 years ago which produced approximately a 50% increase in the cosmic ray background over a period of about one to two hundred years. This resulted in some temporary climatic change such as



blizzards, but was not severe enough to perturb climate from its present interglacial phase.

Magnitude 3: A long duration superwave cosmic ray burst that produces a major increase in the cosmic ray background level, doubling the background level, lasting several hundred to a thousand years, and injecting interstellar dust in sufficient quantities to destabilize climate initiating a period of glacial growth. Examples would be the events that initiated glacial stage 5-d about 110,000 years ago or stage 4 about 70,000 years ago.

Magnitude 4: A much longer duration superwave cosmic ray burst capable of increasing the cosmic ray levels 2 to 4 fold above the background level and lasting several thousand years, with dust injection into the solar system maintained long enough to activate the Sun into a state of excessive flare activity. Such an event would induce climatic effects more extreme than a Magnitude 3 superwave, sufficient to initiate a global warming period that would terminate an ice age or induce an interstadial. Examples would be the superwave events that ended the Illinoisan glaciation (stage 6) about 130,000 - 140,000 years ago or ended the Wisconsin ice age about 16,000 - 10,000 years ago, the more recent precipitating the Pleistocene extinction. Another event around 34,000 - 37,000 years ago occurred around the time of the demise of Neanderthal Man.

2. A physical quantity is expressed as the product of a numerical value and a physical unit, not merely a number. The quantity does not depend on the unit (i.e. for distance, 1 km is the same as 1000 m), although the number depends on the unit. Thus, following the example of distance, the quantity does not depend on the length of the base vectors of the coordinate system. Also, other changes of the coordinate system may affect the formula for computing the scalar (for example, the Euclidean formula for distance in terms of coordinates relies on the basis being orthonormal), but not the scalar itself. In this sense, physical distance deviates from the definition of metric in not being just a real number; however it satisfies all other properties. The same applies for other physical quantities which are not dimensionless. Direction does not apply to scalars; they are specified by magnitude or quantity alone.

Some examples of scalars include the mass, charge, or the temperature, or electric potential at a point inside a medium. The distance between two points in three-dimensional space is a scalar, but the direction from one of those points to the other is not, since describing a direction requires two physical quantities such as the angle on the horizontal plane and the angle away from that plane. Force cannot be described using a scalar, since force is composed of direction and magnitude, however, the magnitude of a force alone can be described with a scalar, for instance the gravitational force acting on a particle is not a scalar, but its magnitude is. The speed of an object is a scalar (e.g. 180 km/h), while its velocity is not (i.e. 180 km/h *north*).

In the theory of relativity, one considers changes of coordinate systems that trade space for time. As a consequence, several physical quantities that are scalars in "classical" (non-relativistic) physics need to be combined with other quantities and treated as four-dimensional vectors or tensors. For example, the charge density at a point in a medium, which is a scalar in classical physics, must be combined with the local current density (a 3-vector) to comprise a relativistic 4-vector. Similarly, energy density must be combined with momentum density and pressure into the stress-energy tensor. In a Euclidean space, the separation between two points is measured by the distance between the two points. A distance is purely spatial, and is always positive. In spacetime, the separation between two events is measured by the *invariant interval* between the two events, which takes into account not only the spatial separation between the events, but also their temporal separation.

For two events separated by a time-like interval, enough time passes between them for there to be a cause–effect relationship between the two events. For a particle traveling through space at less than the speed of light, any two events which occur to or by the particle must be separated by a time-like interval. Event pairs with time-like separation define a negative squared spacetime interval ($s^2 < 0$) and may be said to occur in each other's future or past. There exists a reference frame such that the two events are observed to occur in the same spatial location, but there is no reference frame in which the two events can occur at the same time.

A frame of reference in physics, may refer to a coordinate system or set of axes within which to measure the position, orientation, and other properties of objects in it, or it may refer to an *observational reference frame* tied to the state of motion of an observer. It may also refer to both an observational reference frame and an attached coordinate system as a unit.

3. As Kozyrev formulated it in his own words:

“Time possesses a specific property of distinguishing causes from effects, which may be called directionality or course. This property determines the difference between the past and the future” (Kozyrev, 1963, p. 2).

Let's see closely how this is accomplished according to Kozyrev. In fact Kozyrev imagined an elementary cause-effect link which comprises two material points designating the cause and the effect separated by an *empty spacetime point* as he called it. *Empty point* means according to Kozyrev a point where there is no matter there, just a bare spacetime point. This empty point is very important since the conversion of the cause to an effect requires overcoming it. Elsewhere Kozyrev refers to it as the “...abyss, the transition through which can be realized only with the aid of time” (Kozyrev, 1963, p. 3). This point has a spatial coordinate δr and a temporal coordinate δt signifying the fact that causes and effects are always separated in space and in time. According to my reading, these two quantities, over which much ambiguity still looms even among Kozyrev's followers (see Shikhobalov, 1996a) [14], shouldn't really be thought as indicating *everyday* space and time intervals: they certainly are of a more abstract nature. The very word *abyss* used by Kozyrev points to that direction. As I understand it Kozyrev meant St to signify the absolute (positive) difference between the future and the past, the *world-arrow* as modern philosophers sometimes call it, while δr signifies more generally a direction in space. Someone would say that in an isotropic space as that of our Universe there are no differences in directions, but still we can find a difference between a right-handed coordinate system from a left

handed coordinate system: in this case it may be suggested that conventionally a positive sign of δr would correspond to the former while a minus sign would correspond to the later. Both quantities therefore signify mostly abstract directions and do not take any particular values. In this regard the elementary cause-effect link shouldn't be thought as the <<real>> spacetime distance between cause and effect. It is less than physical and more of a philosophical (or metaphysical if you wish) kind of *link*. We tentatively therefore posit

$$\begin{aligned}\delta r &= \text{direction in space} \equiv (i, j, k) \equiv + \\ &\text{for a right handed coordinate system,} \\ \delta t &\equiv \text{future} - \text{past} \equiv +,\end{aligned}\tag{1}$$

where δr is parameterized by the basis vectors of a Cartesian coordinate system i, j, k . Through δr and δt a quantity of utmost importance for Kozyrev's theory is defined, the so called *course of time*:

$$c_2 = \delta r / \delta t.\tag{2}$$

According to the previous discussion, the course of time determines the transition rate from the cause to the effect in an elementary cause-effect link. It should be emphasized here again that the whole process doesn't just occur in time, but with the aid of time. So we can think of c_2 as the velocity of a time-energy field (I will comment more on that later). Since δr and δt refer to the <<empty>> spacetime point, c_2 shouldn't be dependent on any particular physical system but it should be thought of as a universal constant. Kozyrev indeed postulated the universality of c_2 and even went as far as to calculate it through experiments, finding:

$$|c_2| \approx 2200 \text{ km/s} \approx \alpha c,$$

where α is the fine structure constant and c is the velocity of light in the vacuum. It should be emphasized again that c_2 was calculated through

experiments and not through type (2) which serves more as a philosophical definition, according to what we said earlier about δr and δt .

Kozyrev now imagined a parity transformation, i.e. our world reflected in a mirror. As it is known parity transformation corresponds to a transformation from a right-handed coordinate system to a left-handed one. Therefore, according to (1) δr will acquire a minus sign.

If on the other hand δt signifies the world arrow, the way people think that future is always *ahead* of their past, then in the mirror world too δt has to keep the same sign, otherwise this would let to an absurdity. So we have

$$\begin{aligned}\delta r \equiv (\hat{i} \hat{j} \hat{k}) \equiv + & \Longrightarrow \delta r' \equiv (\hat{i}' \hat{j}' \hat{k}') \equiv - \\ \delta r \equiv + & \Longrightarrow \delta r' \equiv +,\end{aligned}$$

where i', j', k' are the basis vectors of the inverse axes. Then according to (2) the constant c_2 has to change its sign under the parity transformation which makes it a pseudoscalar rather than a scalar quantity. This gives us a clear distinction between the world-arrow δt , the <<apparent>> direction of time, from the causal arrow represented by c_2 , the *real* direction of time. While the distinction between these two arrows is usually used as an argument by modern philosophers to devaluate any relation between causal theory and the direction of time, Kozyrev accomplishes with the same argument just the opposite, giving time a substance: real time appears as an energylike field which offers its energy for the transformation of a cause to an effect while the <<apparent time>> is just the psychological notion of the time that people have in order to differentiate a past behind them from a future that awaits them. At least this is my reading of Kozyrev's notion of time (Leivaditis 2008) [11].

4. Saturation of this energy makes two things possible: we can decrease the volume of water that they contain or increase it, by very simple mechanical procedures. We are not dealing with some weak, unseen force, but rather a source of almost impossibly grand power, which

would have more than enough strength to sustain the existence of all of physical matter.

Still, following the sponge metaphor, when a submerged, saturated sponge is squeezed, cooled or rotated, then some of the water (energy) inside of it will be released into its surroundings, decreasing its mass.

Once the sponge is no longer disturbed, the pressure on the millions of tiny pores is relieved, causing it to again absorb water and expand back to its normal resting mass. Or, one can pump more water pressure into the sponge in its rest state, say, by heating (vibrating) it, causing some of the sponge pores to expand with more water than they can comfortably hold. When the added pressure is released, the sponge will shrink back down to its normal resting mass.

5. Work in $N = 1$ quasiexperimental and $N=16$ entrainment experimental design with human volunteers placed inside a modified SQUID (superconducting quantum interference device) has shown that the causal product-moment is evident for as long as any one human volunteer inside the SQUID experienced such an observership moment last.

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